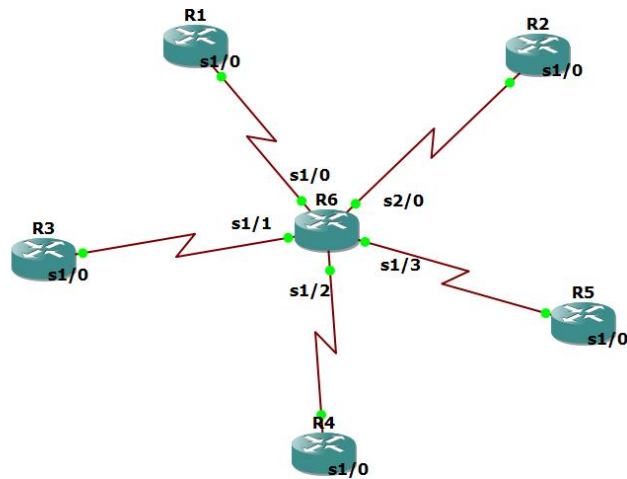


DMVPN configuration



```
R1
Conf t
int se1/0
ip add 150.1.16.1 255.255.255.0
no shut
ip route 0.0.0.0 0.0.0.0 150.1.16.6
int lo0
ip add 10.1.1.1 255.255.255.0
```

```
R2
conf t
int se1/0
ip add 150.1.26.2 255.255.255.0
no shut
ip route 0.0.0.0 0.0.0.0 150.1.26.6
int lo0
ip add 10.2.2.2 255.255.255.0
```

```
R3
conf t
int se1/0
ip add 150.1.36.3 255.255.255.0
no shut
ex
ip route 0.0.0.0 0.0.0.0 150.1.36.6
int lo0
ip add 10.3.3.3 255.255.255.0
```

```
R4
conf t
int se1/0
ip add 150.1.46.4 255.255.255.0
no shut
ip route 0.0.0.0 0.0.0.0 150.1.46.6
int lo0
ip add 10.4.4.4 255.255.255.0
```

```
R5
conf t
int se1/0
ip add 150.1.56.5 255.255.255.0
no shut
ex
ip route 0.0.0.0 0.0.0.0 150.1.56.6
int lo0
ip add 10.5.5.5 255.255.255.0
```

R6

```
int se1/0
ip add 150.1.16.6 255.255.255.0
no shut
!
int se1/1
ip add 150.1.36.6 255.255.255.0
no shut
!
int se1/2
ip add 150.1.46.6 255.255.255.0
no shut
!
int se1/3
ip add 150.1.56.6 255.255.255.0
no shut
!
int se2/0
ip add 150.1.26.6 255.255.255.0
no shut
```

TUNNEL CONFIG

```
R1
int tunnel 0
ip address 192.168.1.1 255.255.255.0
tunnel source 150.1.16.1
tunnel mode gre multipoint
ip nhrp network-id 10
```

```
ip nhrp map 192.168.1.2 150.1.26.2
ip nhrp map 192.168.1.3 150.1.36.3
ip nhrp map 192.168.1.4 150.1.46.4
ip nhrp map 192.168.1.5 150.1.56.5
```

R2

```
int tunnel 0
ip address 192.168.1.2 255.255.255.0
tunnel source 150.1.26.2
tunnel mode gre multipoint
ip nhrp network-id 10
ip nhrp map 192.168.1.1 150.1.16.1
ip nhrp map 192.168.1.3 150.1.36.3
ip nhrp map 192.168.1.4 150.1.46.4
ip nhrp map 192.168.1.5 150.1.56.5
```

R3

```
int tunnel 0
ip address 192.168.1.3 255.255.255.0
tunnel source 150.1.36.3
tunnel mode gre multipoint
ip nhrp network-id 10
ip nhrp map 192.168.1.1 150.1.16.1
ip nhrp map 192.168.1.2 150.1.26.2
ip nhrp map 192.168.1.4 150.1.46.4
ip nhrp map 192.168.1.5 150.1.56.5
```

R4

```
int tunnel 0
ip address 192.168.1.4 255.255.255.0
tunnel source 150.1.46.4
tunnel mode gre multipoint
ip nhrp network-id 10
ip nhrp map 192.168.1.1 150.1.16.1
ip nhrp map 192.168.1.2 150.1.26.2
ip nhrp map 192.168.1.3 150.1.36.3
ip nhrp map 192.168.1.5 150.1.56.5
```

R5

```
int tunnel 0
ip address 192.168.1.5 255.255.255.0
tunnel source 150.1.56.5
tunnel mode gre multipoint
ip nhrp network-id 10
ip nhrp map 192.168.1.1 150.1.16.1
ip nhrp map 192.168.1.2 150.1.26.2
ip nhrp map 192.168.1.3 150.1.36.3
ip nhrp map 192.168.1.4 150.1.46.4
```

Problem:

Up till now, we solved the problem of having to make separate tunnels for every router as in case of simple gre.

This works as we can check by pinging the private addresses, but this is tedious as we needed to write the nhrp table separately on every router and add a new entry for every new router that enters the configuration. Basically, there is a scalability problem.

So we make one router as **NEXT HOP SERVER**,

Now we will first remove the old tunnel configuration on every router:

```
no int tunnel 0
```

HUB:

R1

```
int tunnel 0
ip address 192.168.1.1 255.255.255.0
tunnel source 150.1.16.1
tunnel mode gre multipoint
ip nhrp network-id 10
```

R2

```
int tunnel 0
ip address 192.168.1.2 255.255.255.0
tunnel source 150.1.26.2
tunnel mode gre multipoint
ip nhrp network-id 10
ip nhrp nhs 192.168.1.1
ip nhrp map 192.168.1.1 150.1.16.1
```

R3

```
int tunnel 0
ip address 192.168.1.3 255.255.255.0
tunnel source 150.1.36.3
tunnel mode gre multipoint
ip nhrp network-id 10
Ip nhrp nhs 192.168.1.1
ip nhrp map 192.168.1.1 150.1.16.1
```

R4

```
int tunnel 0
ip address 192.168.1.4 255.255.255.0
tunnel source 150.1.46.4
tunnel mode gre multipoint
ip nhrp network-id 10
ip nhrp nhs 192.168.1.1
ip nhrp map 192.168.1.1 150.1.16.1
```

```
R5
int tunnel 0
ip address 192.168.1.5 255.255.255.0
tunnel source 150.1.56.5
tunnel mode gre multipoint
ip nhrp network-id 10
Ip nhrp nhs 192.168.1.1
ip nhrp map 192.168.1.1 150.1.16.1
```

Now if we ping any private address, a spoke (other routers) will send an NHRP Resolution request to hub which will then forward it to the intended router to get the public address of the router, then an NHRP reply will be sent. This process as soon as tunnel configuration is done on the routers. In hub's nhrp table we can see all entries are dynamic and on spokes, there is only one entry which is to the hub as static.

Routing Protocol with DMVPN

On all spokes,
Int tun 0
Ip nhrp map multicast 150.1.16.1

On hub,
Ip nhrp map multicast dynamic

Int tun 0
Shut
Then first do no shut on hub, then on others
No shut

```
router eigrp 100
no auto-summary
network 10.0.0.0 0.255.255.255
network 192.168.1.0 0.0.0.255
```

Problem

Now, the routing tables are not complete as spokes are not directly connected to each other because of split horizon (If you receive an update on the same interface, it is not forwarded back to the same interface)

```
Int tunnel 0
No ip split-horizon eigrp 100
```

REDUNDANT HUB

Will make R2 a second hub for redundancy:

```
On R2
No int tun 0
Int tun 0
Ip address 192.168.1.2 255.255.255.0
Ip address 192.168.1.1 255.255.255.0
Tunnel source serial1/0
Tunnel mode gre multipoint
Ip nhrp network-id 10
Ip nhrp map multicast dynamic
Ip nhrp redirect
```

On others make a static mapping to R2

```
ip nhrp map 192.168.1.2 150.1.26.2
ip nhrp nhs 192.168.1.1
Then do
No ip nhrp network-id 10
ip nhrp network-id 10
```

Now all traffic first goes through R1, so to prevent that we do
No ip next-hop-self eigrp 100

Protection

```
Crypto isakmp policy 10
Encryption 3des
Authentication pre-share
Hash md5
Group 2
!
Crypto isakmp key cisco address 0.0.0.0
!
Crypto ipsec transform-set T-SET esp-3des esp-sha-hmac
!
Crypto ipsec profile I-PROF
Set transform-set T-SET
!
Int tun 0
Tunnel protection ipsec profile I-PROF

do clear crypto isakmp
do clear crypto session
```